R041-07-101068-2A - RG / CD

RADIO TEST REPORT

According to the standard(s):

FCC part 15 (02/2006)

Equipment under test:

Pool alarm - Sensor Espio
ref ESP007-US

FCC ID: UQJ - 060

Company:

MG International

Diffusion: Mr CHAUSSIN (Company: MG International)

Number of pages: 29 including 4 annexes

Ed.	Date	Modified page(s)	Written by Name Visa	Technical verification Name Visa	Quality approval Name Visa
0	29-Mar-07	Creation	Régis GONZALEZ	Olivier HEYER	Olivier HEYER

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NAME OF THE EQUIPMENT UNDER TEST (E.U.T.)	:	Pool alarm - Sensor Espio ref ESP007-US
Serial number	:	None
Part number	:	None
Software Version	:	None
MANUFACTURER'S NAME	:	MG International

APPLICANT'S ADRESS:

Company	:	MG International
Adress	:	Zone Industrielle Athelia II Avenue de la Sariette 13600 LA CIOTAT FRANCE
Person(s) present during the tests	:	Nobody
Responsible	:	Mr CHAUSSIN

DATE(S) OF TESTS	:	January, the 31st, February, the 1st and March, the 3rd and the 5th of 2007
TESTS LOCATION(S)	:	EMITECH Grand Sud laboratory in Vendargues (34) Open area test site in Salinelles (30) FCC Registration Number: 812719
TESTS SUPERVISOR(S)	:	None
TESTS OPERATOR(S)	:	Régis GONZALEZ

CONTENTS

1. INTRODUCTION

This document submits the results of Radio tests performed on the equipment Pool alarm - Sensor Espio ref ESP007-US (denominated hereafter E.U.T.: equipment under test) according to document(s) listed below.

2. REFERENCE DOCUMENT(S)

FCC Part 15 (02/2006)	Code of Federal Regulations Title 47 – Telecommunications Chapter 1 – Federal Communications Commision Part 15 – Radio frequency devices Subpart C – Intentional Radiators
ANSI C 63.4 (03)	American National Standard for Methods of measurement of Radio-Noise from low-voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

3. EQUIPMENT UNDER TEST CONFIGURATION

Equipment under test (E.U.T.) general description: Stand alone detector of immersion for swimming-pool including detector unit transceiver and receiver siren

Equipment control procedure during immunity tests: N.A. emission test only

Susceptibility criteria during a continuous disturbance: N.A. emission test only

Susceptibility criteria during a transitory disturbance: N.A. emission test only

Cycle and operating mode during emission tests: Permanent no modulated emission exepted for bandwidth measurement

Equipment modifications applied during tests: No

N.A.: Not applicable

4. EQUIPMENT CHARACTERISTIC

FCC ID: UQJ-060

ITU emission code: 7K00A1D

Utilization: Swimming-pool alarm system transceiver with radio siren control

Antenna type: Integrated wire antenna

Operating frequency: 433.92 MHz

Number of channels: 1

Channel spacing: Not concerned

Frequency generation: □ SAW Resonator □ Crystal ☒Synthetizer

Modulation: ☒ Amplitude (pulsed modulated device) □ Digital □ Frequency □ Phase

Power source: 4 x LR20 alkaline cells (4 x 1,5 V = 6 V)

5. EQUIPMENT UNDER TEST CONFIGURATION SCHEME

Equipment is set out on a wooden table at 0.8 m of the ground plane (see Photographs in annex 1).

6. SUMMARY OF TEST RESULTS

Tests designation or section		Results satisfying?	Comments
15.33	Frequency range of radiated measurement	-	Considered
15.35	Measurement detector functions and bandwidths	-	Considered
15.107	Conducted limits	YES	For receiver in class B (informative)
15.109	Radiated emission limits	YES	For receiver in class B (informative)
15.203	Antenna requirement	YES	Nota 1
15.205	Restricted bands of operation	YES	
15.209	Radiated emission limits, general requirements	YES	
15.231	Periodic operation in the band 40.66 – 40.70 MHz and above 70 MHz		
	a) Transmission requirements	YES	Nota 2
	b) Radiated emission	YES	Nota 3
	c) Occupied bandwidth	YES	Nota 4
	d) Frequency tolerance	N.A.	E.U.T. does not transmit in the band 40.60 – 40.70 MHz
	e) Periodic alternate field strength measurement	N.A.	Requirements of a) is used

N.P.: Not Performed. N.A.: Not Applicable.

Sample submitted to the tests complies with the regulations of the standard FCC part 15 (02/2006) according to limits specified in this tests report.

Nota 1: Internal antenna without connector

Nota 2: Periodic transmissions at regular predetermined intervals are used to determine system integrity of transmitter for safety application (swimming-pool alarm). Four transmissions per hour of 375 ms each are transmitted (See Photograph(s) in annex 3).
When manually operated transmission is used (switch on/off), the duration is less than 5s (See Photograph(s) in annex 4).

Nota 3: Calculation of field strength limit of fundamental (433.92 MHz):
41.6667 (F) – 7083.3333 = 10 976 µV/m = 80.8 dBµV/m

Nota 4: The bandwidth of the emission at 20 dBc is 6.40 kHz (see Graph(s) in annex 2), less than 0.25 % of the center frequency (1084 kHz)

7. AC POWER LINE CONDUCTED EMISSION FOR RECEIVER

Standard: FCC part 15 (02/2006)

Test method: ANSI C 63-4:2003

Test configuration:

Tested cable	Measure with	E.U.T height (cm)
Power supply 115VAC 60 Hz (*)	LISN	40

Frequency band	Tested cable	Resolution Bandwidth	Video Bandwidth	Detection mode
Neutral				
150kHz-30MHz	Power supply 115VAC	10kHz	30kHz	Peak
Line				
150kHz-30MHz	Power supply 115VAC.	10kHz	30kHz	Peak

(*) Adapter FRIWO: FW75550/12
100-240V~ / 47-63 Hz / 400 mA
12V⎓ / 1.25 A

Test method deviation: No

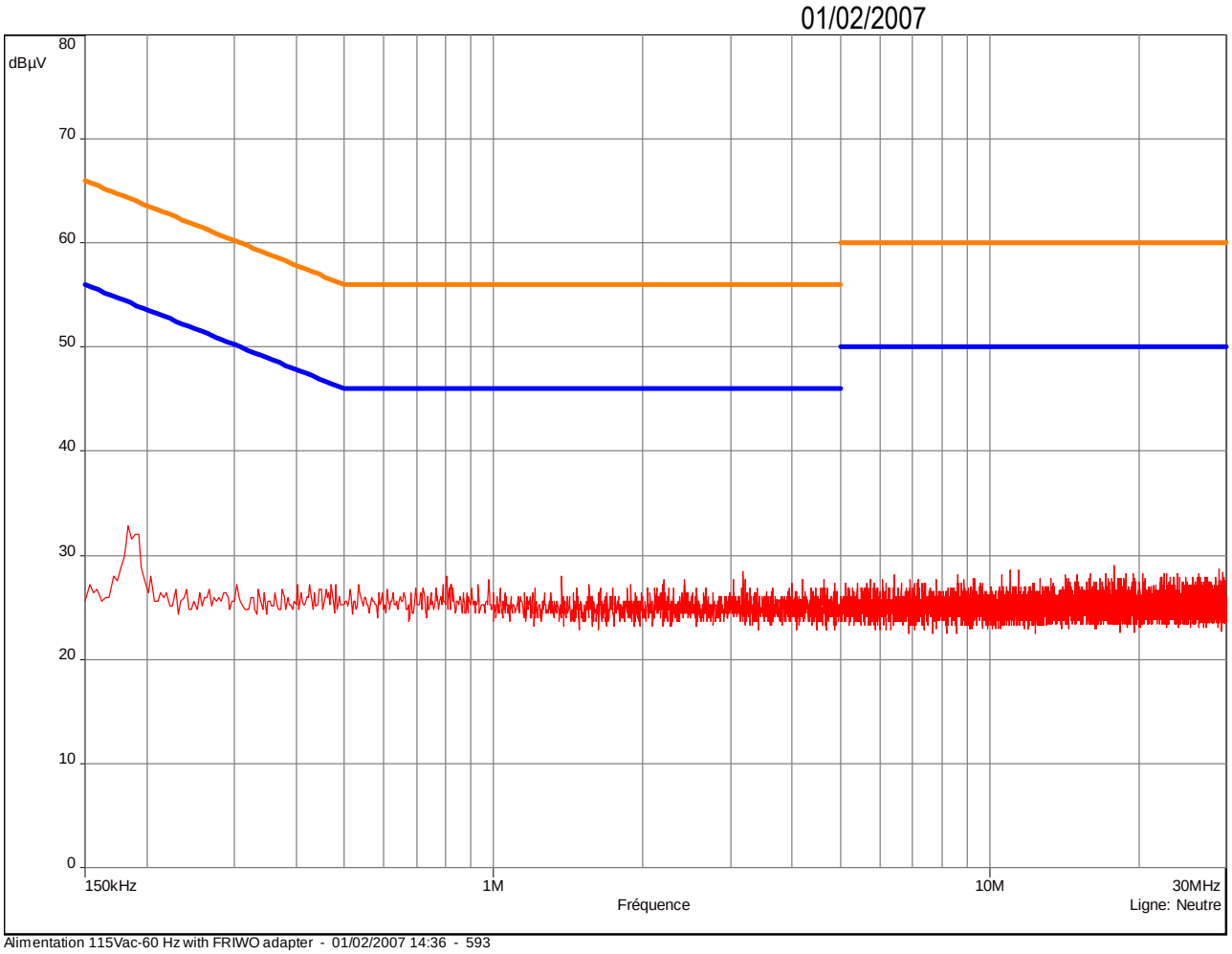
Instrumentation test list:

CATEGORIE	MARQUE	TYPE	N° EMITECH
LISN	PMM	L3 - 25	833
Shielded enclosure	Ray proof	C.GS1	1423
Software	Nexio	BAT EMC 3.1.7.1.	0000
Spectrum analyzer	Hewlett Packard	8568 B	809
Transient limiter	Hewlett Packard	11947 A	238

Results: See Graphs below. The limits showed on the curves are average (blue) and quasi peak (orange) limits

Siren Receiver

Conducted voltage emission (measurement) - FCC part 15



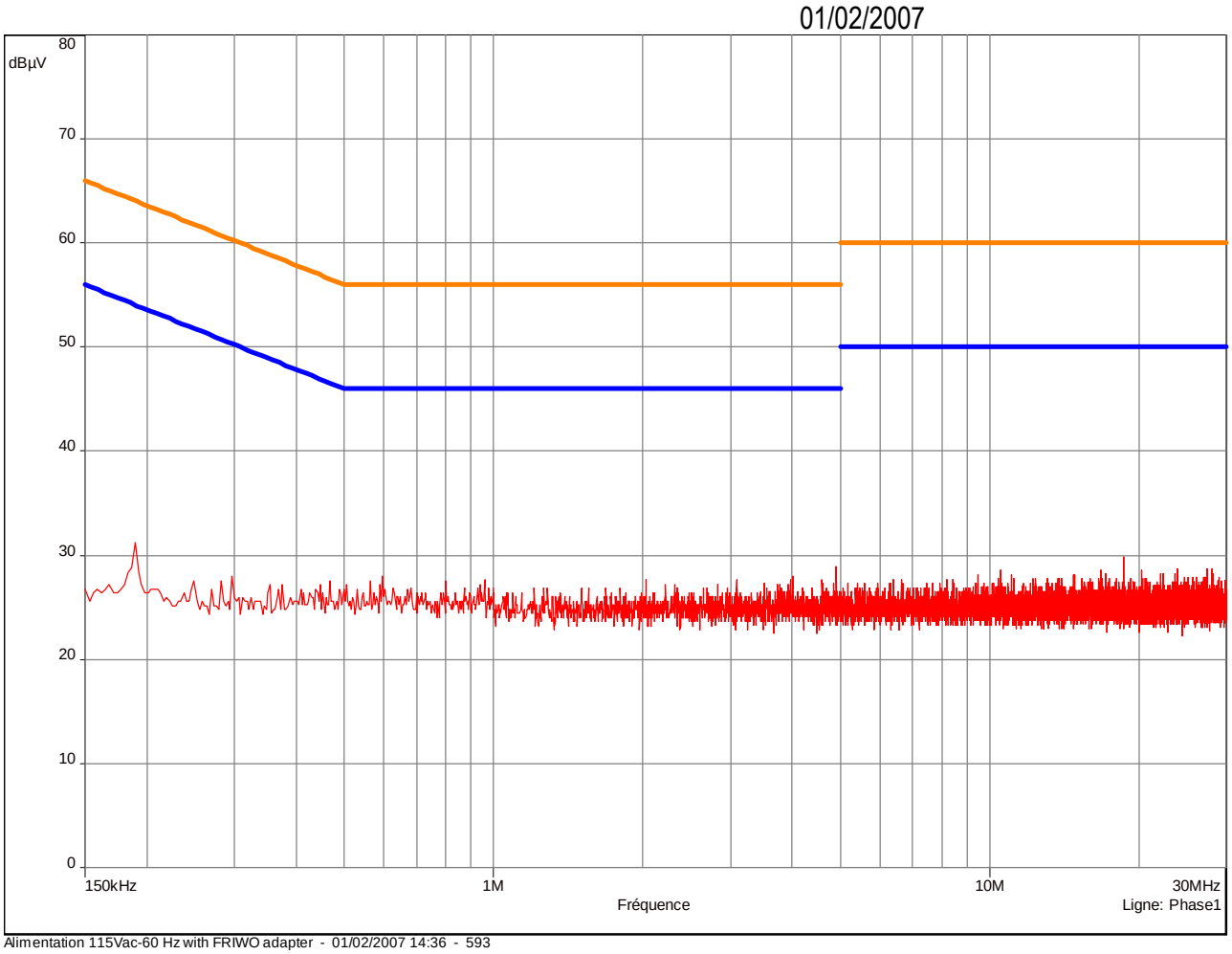
Limits: FCC Part 15 - Cl.B

Parameters:

Ligne	F min	F max	RBW
Neutral	150kHz	1MHz	10kHz
Neutral	1MHz	10MHz	10kHz
Neutral	10MHz	30MHz	10kHz

Siren Receiver

Conducted voltage emission (measurement)- FCC part 15



Limits: FCC Part 15 - Cl.B

Parameters:

Ligne	F min	F max	RBW
Phase1	150kHz	1MHz	10kHz
Phase1	1MHz	10MHz	10kHz
Phase1	10MHz	30MHz	10kHz

8. RADIATED ELECTRIC FIELD MEASUREMENT

Standard: FCC part 15 (02/2006)

Test method: ANSI C 63.4:2003

Measurement on open area test site:

Test configuration: For each measured frequency, receiving antenna height varies between 1 m and 4 m, E.U.T. is set on a turntable in order to find the highest level.

Frequency band	Initial position (0°)	Resolution bandwidth	Measuring distance	Detection mode	E.U.T. height
30MHz-1GHz	0° is the front side	120kHz	3m	Peak	80cm
> 1GHz	0° is the front side	1 MHz	3m	Peak	80cm

Test method deviation: No

Test equipment list:

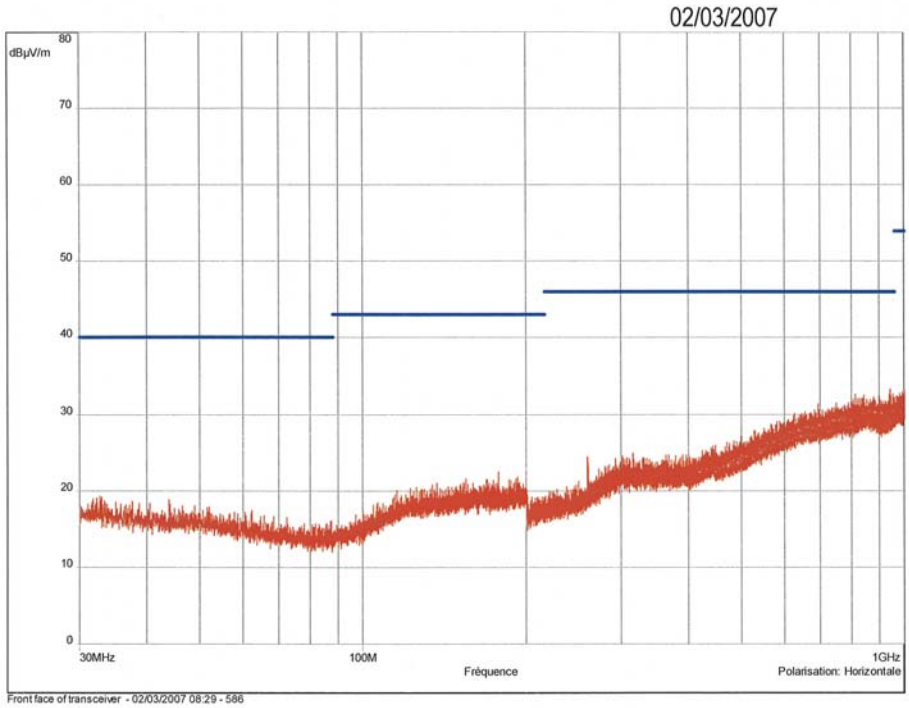
CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Horn antenna	Emco	RGA-60 (3115)	1053
Log-periodic antenna	Rohde & Schwarz	HL223	3126
OATS	Emitech	Salinelles	3482
Preamplifier	Microwave	C005180F-4B1	2165
Spectrum analyzer	Agilent Technologies	E7405A	2161

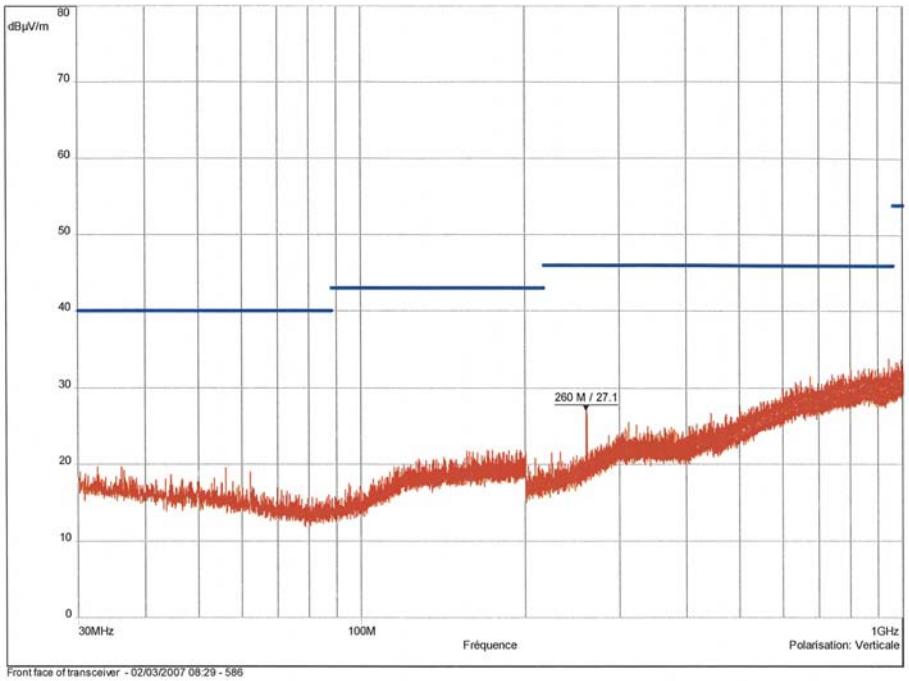
Results: See Board(s) and Graphs below (only highest levels are recorded)

Sensor Espio Transceiver

Radiated emission – receiver mode

Measure at 3 m in semi anechoic chamber in peak detection





Limites :

FCC Part.15 générales - Cl.B

Paramètres :

Polarisation	F min	F max	RBW
Verticale	30MHz	200MHz	100kHz
Horizontale	30MHz	200MHz	100kHz
Horizontale	200MHz	1GHz	100kHz
Verticale	200MHz	1GHz	100kHz

Detection unit

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna Height (cm)	Measure (dBµV/m) without DCF	Duty Cycle Factor (*) (dB)	Standard limit (dBµV/m)	Comments
Transmitter mode						
Fundamental 433.92	170	209	83.80	-6.70	80.80	C
867.84	0	152	34.50	-6.70	60.80	C
1301.76	240	150	49.80	-6.70	54.00 (**)	C
1735.68	242	143	48.50	-6.70	60.80	C
2169.60	247	108	47.90	-6.70	60.80	C
2603.52	251	100	35.90	-6.70	60.80	C
3037.44	169	100	41.70	-6.70	60.80	C
3471.36	229	100	47.30	-6.70	60.80	C
3905.28	246	100	47.10	-6.70	60.80	C
4339.20	250	121	45.60	-6.70	54.00 (**)	C

C: Compliant NC: Not Compliant

VERTICAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna Height (cm)	Measure (dBµV/m) without DCF	Duty Cycle Factor (*) (dB)	Standard limit (dBµV/m)	Comments
Receiver mode						
260.00	250	100	31.20	/	46.00	C
Transmitter mode						
Fundamental 433.92	210	400	84.30	-6.70	80.80	C
867.84	0	100	26.50	-6.70	60.80	C
1301.76	210	163	51.80	-6.70	54.00 (**)	C
1735.68	250	100	45.50	-6.70	60.80	C
2169.60	251	105	46.90	-6.70	60.80	C
2603.52	248	100	39.40	-6.70	60.80	C
3037.44	269	103	46.70	-6.70	60.80	C
3471.36	301	102	45.30	-6.70	60.80	C
3905.28	220	118	45.10	-6.70	60.80	C
4339.20	257	121	50.60	-6.70	54.00 (**)	C

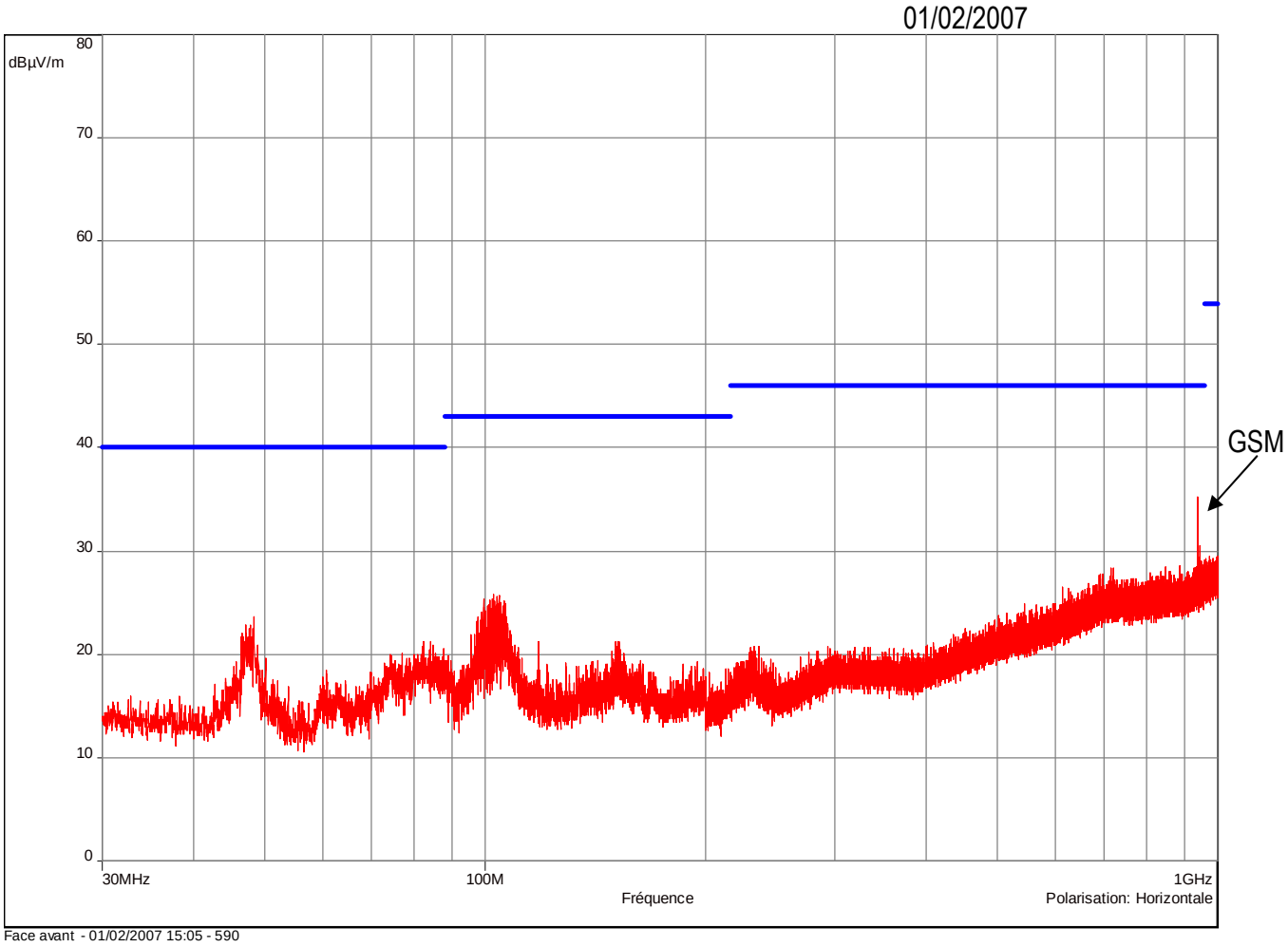
C: Compliant NC: Not Compliant

(*) Duty Cycle correction Factor is 20 Log (52/100) = - 6.70dB
(**) Restricted band of operation (15.205)

Siren Receiver

Radiated electric emission (measurement)- FCC Part 15

Measure at 3 m in semi anechoic chamber in peak detection (informative)



Limits: FCC Part.15 general- Cl.B

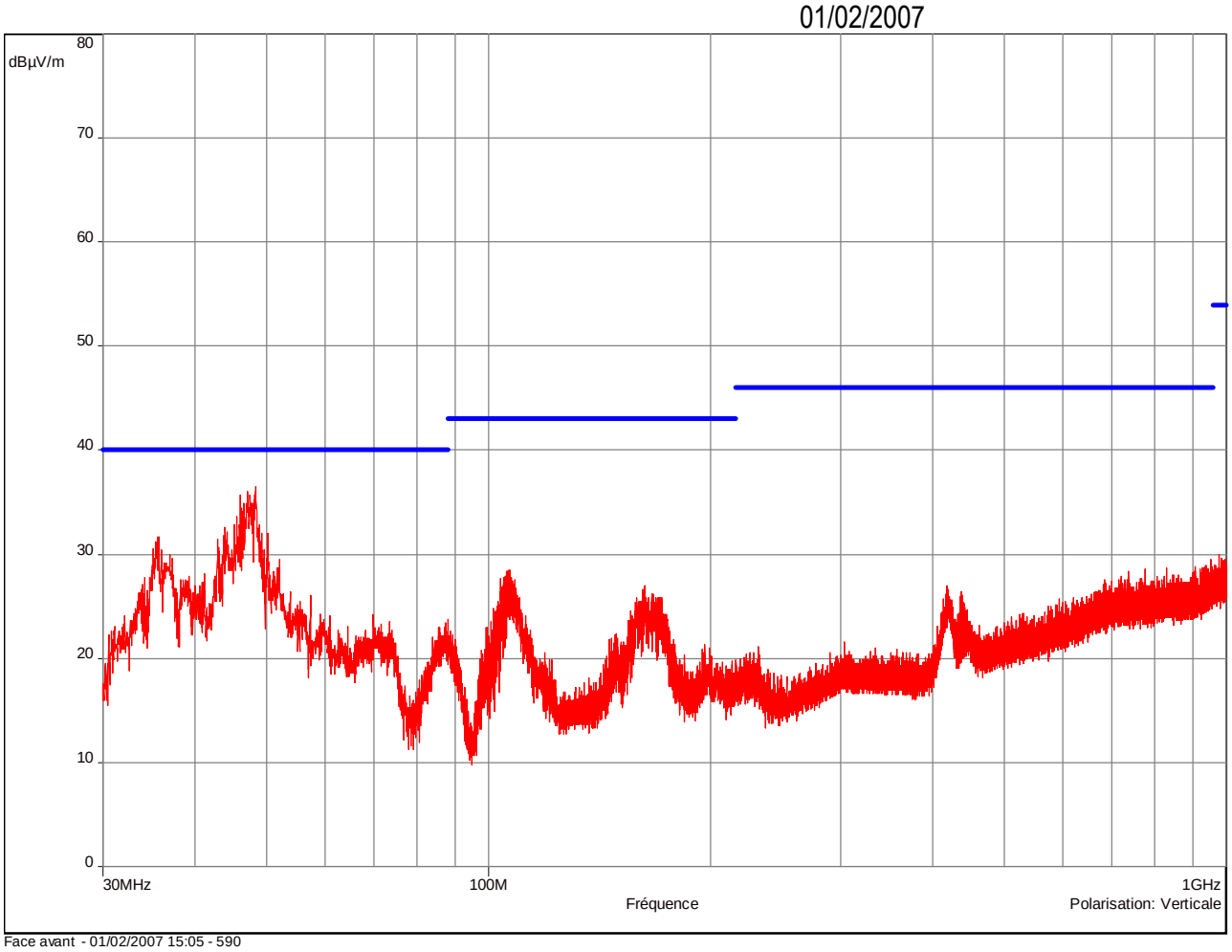
Parameters:

Polarisation	F min	F max	RBW
Horizontal	30MHz	200MHz	100kHz
Horizontal	200MHz	1GHz	100kHz

Siren Receiver

Radiated electric emission (measurement)- FCC Part 15

Measure at 3 m in semi anechoic chamber in peak detection (informative)



Limits: FCC Part.15 general- Cl.B

Parameters:

Polarisation	F min	F max	RBW
Vertical	30MHz	200MHz	100kHz
Vertical	200MHz	1GHz	100kHz

Siren receiver unit

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna Height (cm)	Measure (dBµV/m)	Standard limit (dBµV/m)	Comments
48.40	0	400	16.70	40.00	C
103.70	0	400	17.80	43.00	C

C: Compliant NC: Not Compliant

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna Height (cm)	Measure (dBµV/m)	Standard limit (dBµV/m)	Comments
36.70	0	100	17.20	40.00	C
43.95	0	100	16.40 (*)	40.00	C
45.20	0	100	17.20 (*)	40.00	C
48.40	0	100	17.40	40.00	C

C: Compliant NC: Not Compliant

(*) Noise level

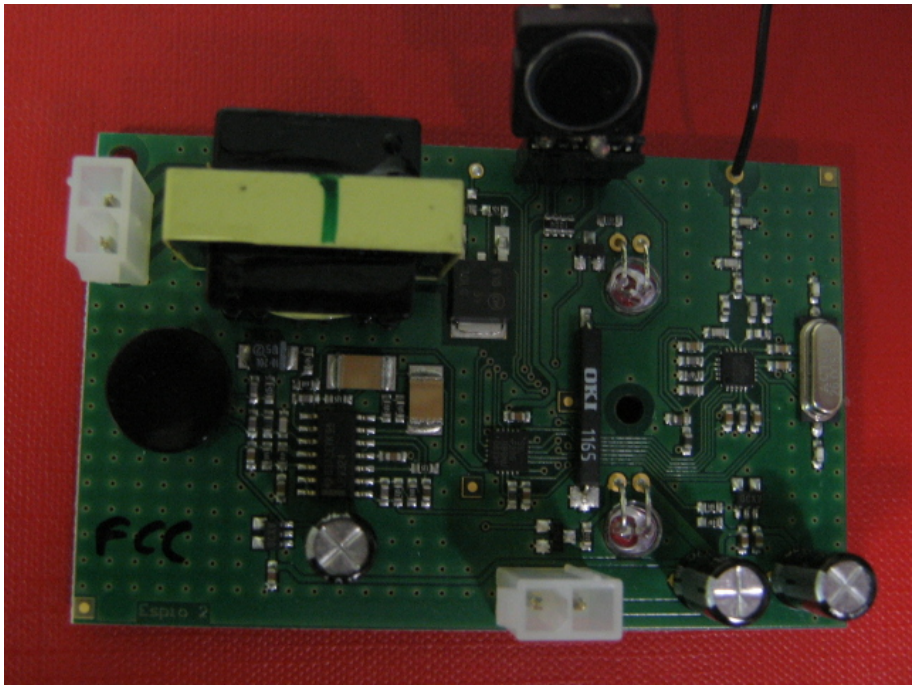
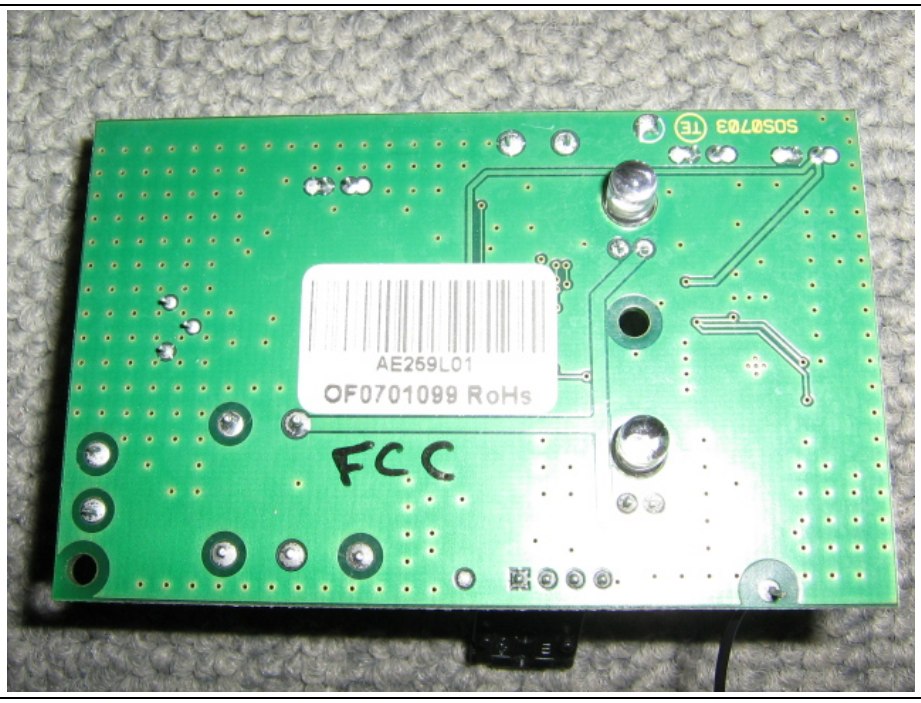
□□□ End of report – 4 annexes to be forwarded □□□

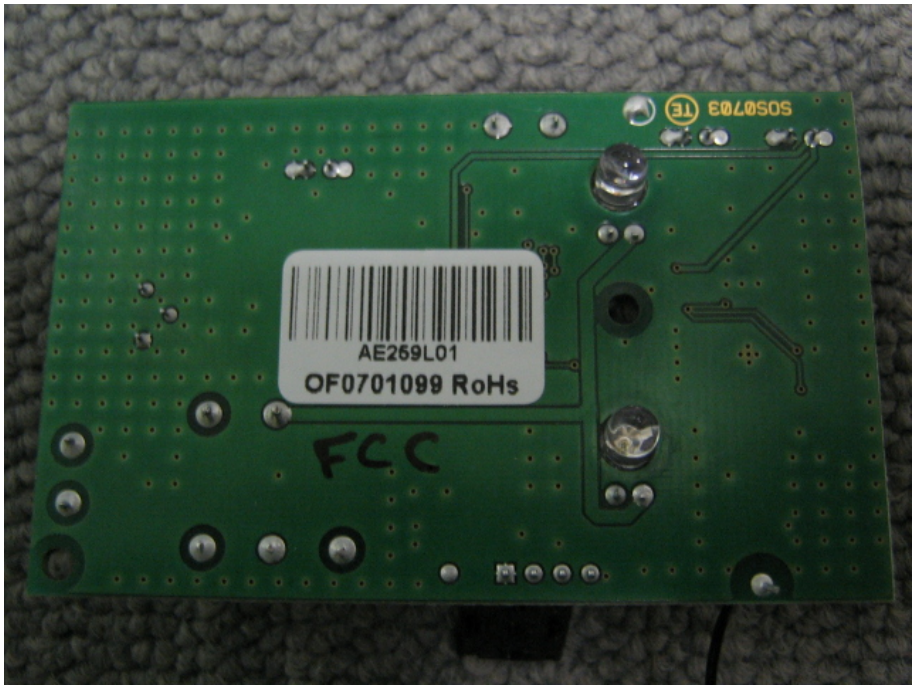
ANNEX 1:
PHOTOGRAPH(S)

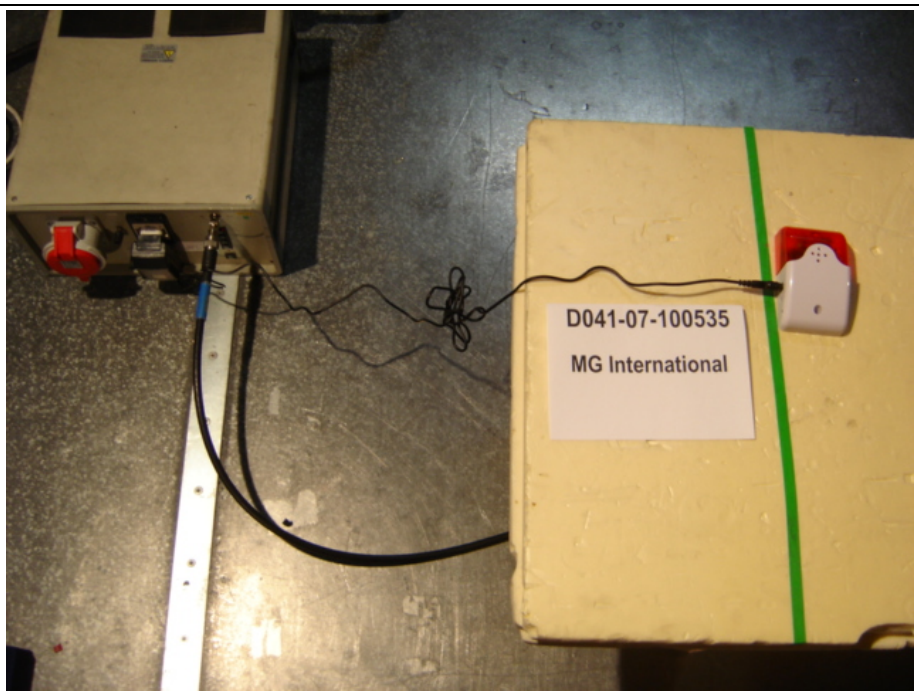
EQUIPEMENT UNDER TEST (E.U.T.) PHOTOGRAPH(S)

Pool alarm - Sensor Espio - ref ESP007-US

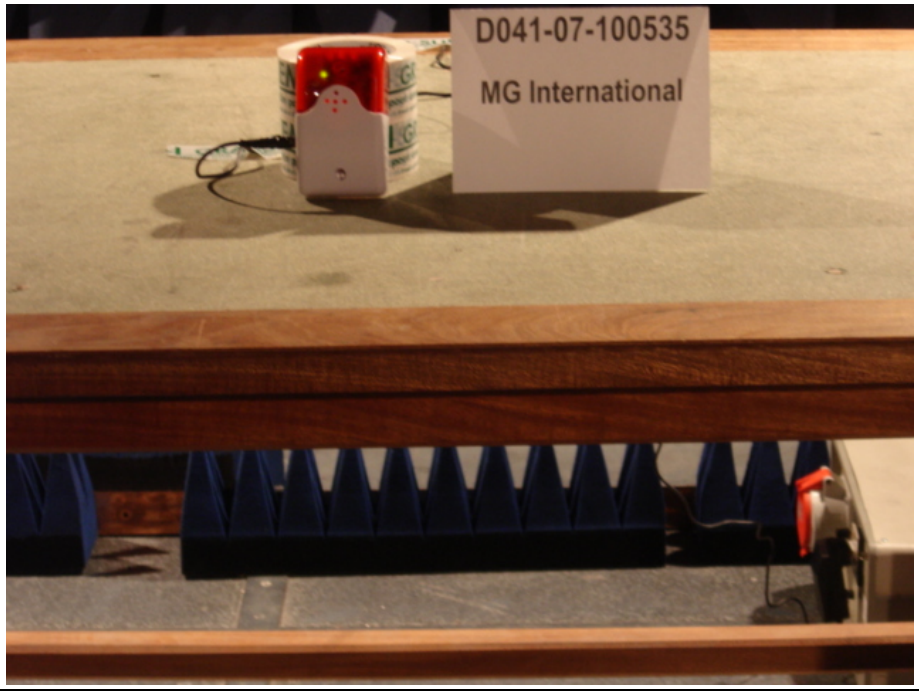
E.U.T.	
E.U.T. Photograph(s) (internal view)	

E.U.T. Photograph(s) (internal view)	
	

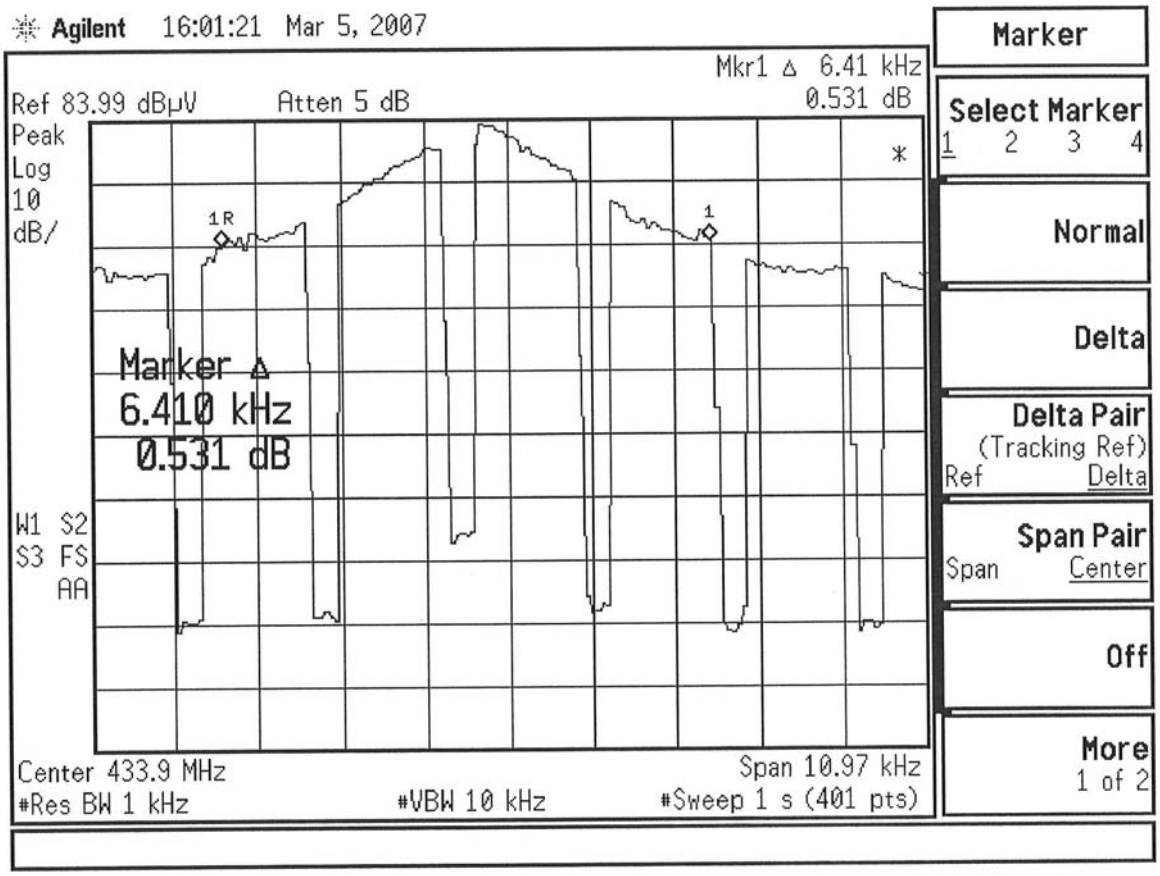
E.U.T. Photograph(s) (internal view)	
Radiated electric emission (measurement in OATS)	

Radiated electric emission (measurement in OATS)	
Conducted emission of siren receiver	

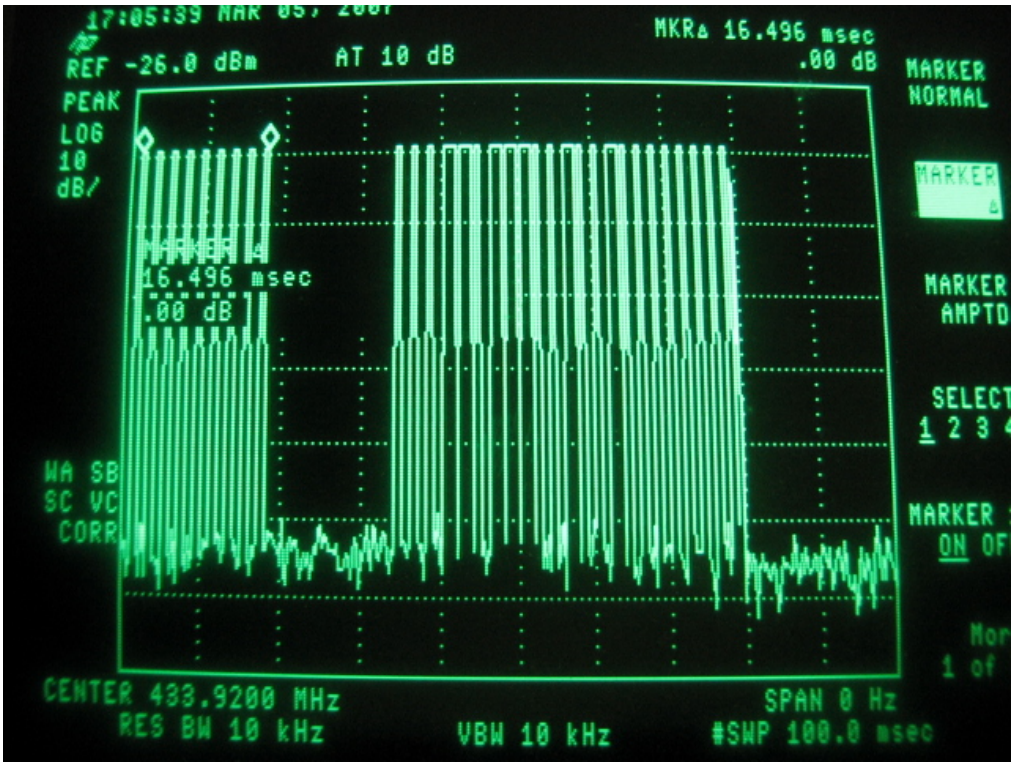
Marking of siren receiver adapter	
Radiated emission in chamber of siren receiver	

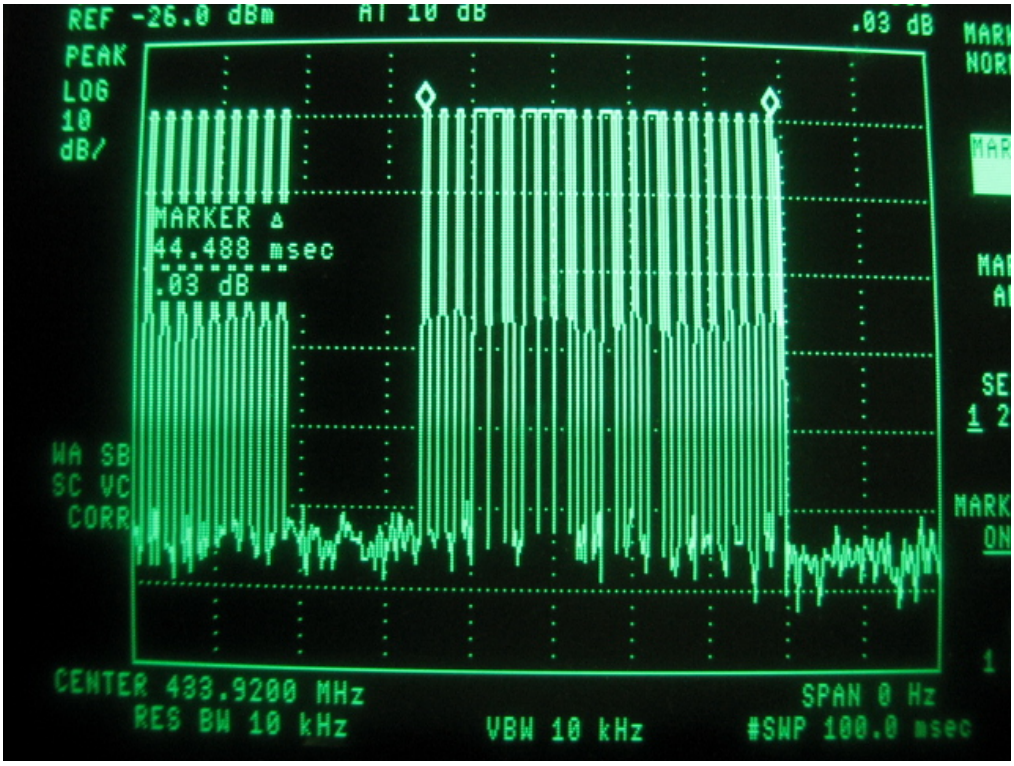
Radiated emission in chamber of siren receiver	
Radiated emission OATS of siren receiver	

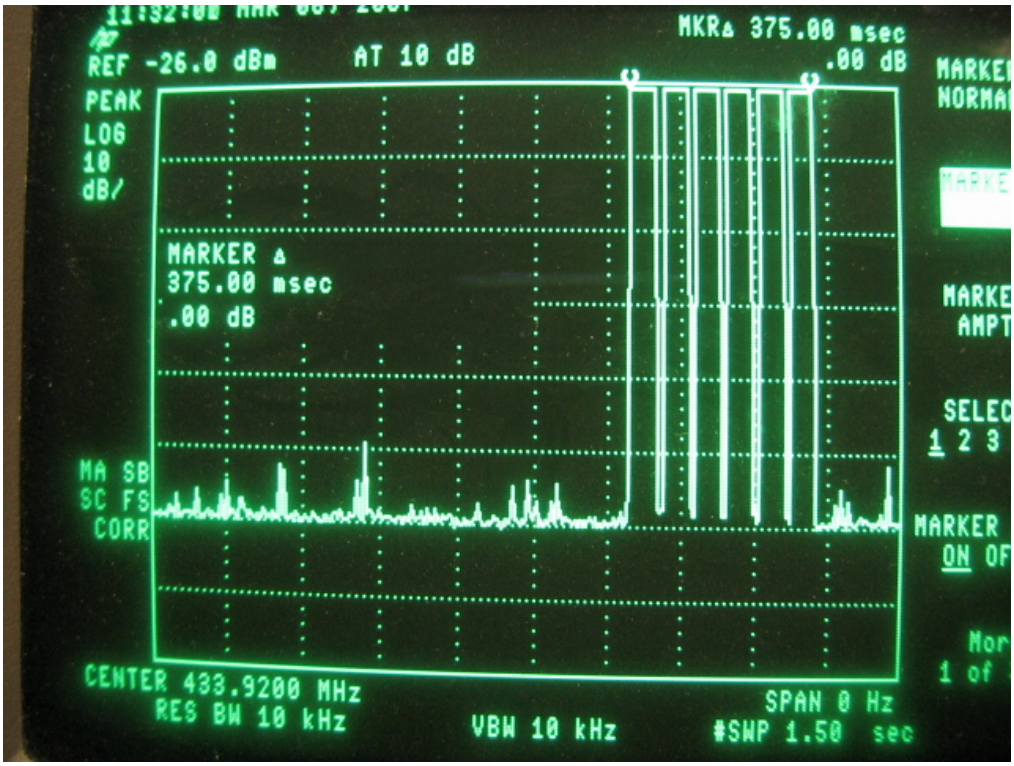
ANNEX 2:
EMISSION BANDWIDTH


Agilent 16:01:21 Mar 5, 2007
Mkr1 Δ 6.41 kHz
0.531 dB
Ref 83.99 dBµV
Atten 5 dB
Peak
Log
10
dB/
1R
1
Marker Δ
6.410 kHz
0.531 dB
W1 S2
S3 FS
AA
Center 433.9 MHz
#Res BW 1 kHz
#VBW 10 kHz
Span 10.97 kHz
#Sweep 1 s (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

ANNEX 3:
TRANSMISSION BURST

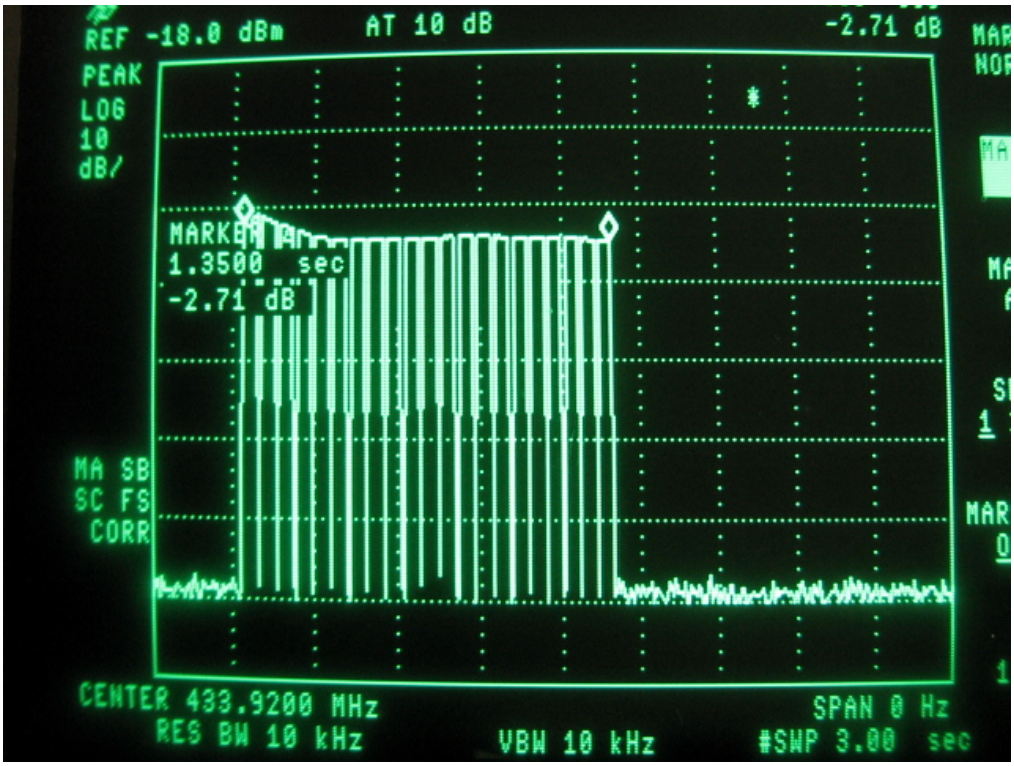

MKRΔ 16.496 msec
.00 dB
REF -26.0 dBm
AT 10 dB
PEAK
LOG
10
dB/
MARKER
NORMAL
MARKER Δ
16.496 msec
.00 dB
MARKER
AMPTD
SELECT
1 2 3
WA SB
SC VC
CORR
MARKER
ON OF
1 of
CENTER 433.9200 MHz
RES BW 10 kHz
VBW 10 kHz
SPAN 0 Hz
#SWP 100.0 msec


REF -26.0 dBm
AT 10 dB
.03 dB
PEAK
LOG
10
dB/
MARKER Δ
44.488 msec
.03 dB
WA SB
SC VC
CORR
CENTER 433.9200 MHz
RES BW 10 kHz
VBW 10 kHz
SPAN 0 Hz
#SWP 100.0 msec


MKRΔ 375.00 msec
.00 dB
REF -26.0 dBm
AT 10 dB
PEAK
LOG
10
dB/
MARKER Δ
375.00 msec
.00 dB
MA SB
SC FS
CORR
CENTER 433.9200 MHz
RES BW 10 kHz
VBW 10 kHz
SPAN 0 Hz
#SWP 1.50 sec

ANNEX 4:

MANUALLY OPERATED TRANSMISSION DURATION


REF -18.0 dBm
AT 10 dB
-2.71 dB
PEAK
LOG
10
dB/
MARKER 1
1.3500 sec
-2.71 dB
MA SB
SC FS
CORR
CENTER 433.9200 MHz
RES BW 10 kHz
VBW 10 kHz
SPAN 0 Hz
#SWP 3.00 sec